DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

OCT 21 2003

FROM: HQ AFCESA/CESC
139 Barnes Drive
Tyndall AFB FL 32403-5319

SUBJECT: **Engineering Technical Letter (ETL) 03-4, Alternate Fuels E85 and B20**

1. Purpose. This ETL prescribes engineering criteria for the development of projects to support E85 and B20 motor fuels. Under public law the United States Air Force (USAF) is mandated to reduce vehicle petroleum consumption by 20 percent in fiscal year (FY) 2005 and 30 percent in FY 2010. To meet this mandate, the USAF has determined that we need to replace 80 percent of our vehicle diesel consumption with B20 and 44 percent of our gasoline consumption with E85. The Civil Engineer will support this requirement through the development and execution of facility projects as determined by requirements developed by local Logistics Readiness Squadron (LRS) Vehicle and Fuels Flights.

2. Application: All CONUS, Alaska, and Hawaii Air Force installations.

2.1. Authority: Executive Order 13149, *Greening the Government Through Federal Fleet and Transportation Efficiency*, 21 Apr 2000.

2.2. Effective Date: Immediately.

2.3. Intended Users:

- Base civil engineers (BCE) responsible for construction activity on Air Force installations
- Air Force Center for Environmental Excellence (AFCEE), U.S. Army Corps of Engineers (USACE), and U.S. Navy offices responsible for design and construction of Air Force facilities

2.4. Coordination:

- Major command (MAJCOM) Fuels engineers
- Headquarters, United States Air Force Installations and Logistics Materiel Management and Policy Division (HQ USAF/ILGP)
- Air Force Petroleum Office (AFPET) [Det 3, Warner Robins Air Logistics Center (WR-ALC/AF)]
- Defense Energy Support Center (DESC-F)

3. Referenced Publications:

3.1. Code of Federal Regulations:

- Title 40, Code of Federal Regulations (CFR), Part 112, *Oil Pollution Prevention*

3.2. Department of Defense (DOD):

- Military Handbook (MIL-HDBK) 1022, *Petroleum Fuel Facilities*
- DOD 7000.14-R, *DOD Financial Management Regulation*, Volume 11b, Chapter 58
- DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal*.

3.3. Department of Energy (DOE):

- *Handbook for Handling, Storing, and Dispensing E85*
- E85: http://www.afdc.doe.gov/altfuel/ethanol.html
- B20: http://www.afdc.doe.gov/altfuel/biodiesel.html

4. Acronyms:

AFCEE	–	Air Force Center for Environmental Excellence
AFCESA	–	Air Force Civil Engineer Support Agency
AFPET	–	Air Force Petroleum Office
BCE	–	base civil engineer
CONUS	–	continental United States
DD	–	Department of Defense (as used on Forms)
DESC	–	Defense Energy Support Center
DOD	–	Department of Defense
DOE	–	Department of Energy
ETL	–	Engineering Technical Letter
FY	–	fiscal year
HQ USAF/ILGP	–	Headquarters, United States Air Force Installations and Logistics Materiel Management and Policy Division
LRS	–	Logistics Readiness Squadron
MAJCOM	–	major command
MIL-HDBK	–	Military Handbook
SPCCP	–	Spill Prevention Control and Countermeasures Plan
UFC	–	Unified Facilities Criteria
USACE	–	U.S. Army Corps of Engineers
USAF	–	United States Air Force
WR-ALC/AF	–	Warner Robins Air Logistics Center

5. Definitions:

5.1. *Biodiesel – B20*: A blend of 80 percent diesel motor fuel and 20 percent biomass-derived ethyl or methyl. May be burned in conventional diesel engines with no modification.

5.2. *E85 Ethanol*: A blend of 15 percent motor gasoline and 85 percent ethanol. Vehicles must be specially equipped to handle this type of product.

6. Responsibilities.

6.1. Base or MAJCOM Vehicle Management and Fuels Management personnel will estimate fuel usage, determine resupply parameters, and set projected goals by year starting in FY 2004 through 2005. Fuels personnel will estimate all current storage, dispensing, and parking facilities and plan for conversion of existing facilities to the maximum extent possible. New tankage will only be considered as a last alternative. Existing tanks and dispensers will be identified as possible use for B20 or E85. Logistics Readiness Vehicle Management and Fuels planners will optimize the distribution of alternate fuels by consolidating vehicles and dispensing facilities where possible.

6.2. The base or MAJCOM civil engineer will assess parking, traffic, tankage, and dispensing equipment identified by Logistics Readiness Fuels for conversion. The BCE will prepare cost estimates and programming documentation for submission through the MAJCOM fuel facilities engineer to AFPET and DESC in accordance with DESC programming guidance in DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal*.

7. Programming and Engineering Considerations.

7.1. B20. There are no special tank or dispenser conversion requirements when using B20.

7.1.1. B20 shall not be used in back-up generator prime movers or in support of equipment where fuel is not completely consumed every 6 months. Provisions must be made to resupply these units either through vendor distribution or through use of separate dedicated diesel-only storage facilities.

7.1.2. Motor fuel storage tanks can accept B20 or diesel products and can be converted from one product to the other at any time.

7.1.3. Segregated pipe manifolding may be required if off-loading or issuing of both products is conducted at the same site.

7.2. E85. Special care is required in converting existing tanks and dispensing facilities.

7.2.1. See the DOE *Handbook for Handling, Storing, and Dispensing E85* for special material requirements. Pre-1992 fiberglass tanks may not be suitable for conversion.

7.2.2. Pay special attention to all internal materials, including tanks, pumps, meters, valves, and gauges. Manufacturers for each item should be contacted to determine the suitability of individual items for contact with E85 products.

7.2.3. Since E85 contains mostly ethanol, which is soluble in water, there may be environmental impacts from spill containment since traditional mechanical separation techniques will not work. This will be contingent on local environmental regulations regarding the release of ethanol. Contact HQ AFCESA/CESC, Mr. Gary Jacks for specific questions on oil water separators.

7.2.4. If aboveground tanks are considered the best solution, the engineer should consider an off-loading header with off-load pump. This may require additional facilities for compliance with the base Spill Prevention, Control and Countermeasures Plan (SPCCP) required by Title 40, Code of Federal Regulations (CFR), Part 112, *Oil Pollution Prevention*. Normally suppliers off-load products into underground tanks by gravity and do not deploy equipment with pumping capability unless specifically required under the supply contract. Coordinate with Fuels Management personnel to determine if the supply contract includes truck delivery with or without off-load pumping capability.

8. Planning. All existing facilities will be used to the maximum extent possible. If additional tanks, dispensers, and piping are required, detailed justification must be included in the Department of Defense (DD) Form 1391, **Military Construction Project Data**, to show that all existing tankage is unusable. Check with local suppliers to ensure that tanks are sized adequately for minimum delivery loads.

9. DESC-Required Programming Documentation for All Bases.

9.1. State the total alternative fuel requirement at the base, including throughput and an estimate of the future annual requirements.

9.2. Identify the facility number and provide a site map.

9.3. List the current numbers of ground fuel storage tanks, locations, and sizes by product type. Explain how these facilities can or cannot be converted to use the alternative fuel requirement.

10. Point of Contact. Recommendations for improvements to this ETL are encouraged and should be furnished to Mr. Pat Mumme, HQ AFCESA/CESM, 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32408-5319, DSN 523-6222, commercial (850) 283-6222, FAX DSN 523-6219, Internet: pat.mumme@tyndall.af.mil.

JEFFREY L. LEPTRONE, Colonel, USAF
Director of Technical Support

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